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ABSTRACT

The Berry Developmental Test of Visual Motor Integration was devised as a measure of the degree to which visual perception and motor behavior are integrated in young children, measured by the copying of geometric forms. In this study, 64 three-year-old children were tested individually to investigate (1) whether there is a correlation between chronological age and geometric form reproduction for three-year-olds, and (2) whether three-year-old boys score lower than three-year-old girls. The results indicated a correlation between age and geometric form reproduction for girls, but not for boys; boys did score significantly lower than girls. While this study more than tripled the original number of three-year-old children tested, the sample is still too inadequate to determine if this test has predictive value at such an early age. (Author/BW)

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SEX DIFFERENCES OF THREE-YEAR-OLD CHILDREN AS MEASURED BY THE BEERY VISUAL-MOTOR TEST

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INTRODUCTION

In recent years, there has been developing an ever increasing interest in the preschool child. The growth of the nursery school movement, especially during the Second World War, and the National Government's legislation regarding the disadvantaged preschooler, have given even greater impetus to the movement for early entrance into day school programs and nursery school programs.

In keeping with the growth and interest in early childhood education, many useful scales have been devised for assessing the development of young children; other scales and tests have been adapted or found useful in evaluation of preschoolers because they are simplified in their administration and scoring. This paper intends to explore one specific instrument, the Visual-Motor Integration Test. The first part of this paper will discuss and describe the instrument itself as designed by the author, Keith Beery. The second part of the article will explore the application of the instrument in an early childhood center, and the sex differences noted in performance of three-year-old boys and three-year-old girls.

PART I. DISCUSSION OF THE VISUAL-MOTOR INTEGRATION TEST

Background

The Developmental Test of Visual-Motor Integration can be administered to children in the age range of two to fifteen years of age, although the author points out that it was designed primarily for the preschool and early primary grades. Format is suitable for both group and individual administration. The VMI consists of 24 designs or geometric forms, which are arranged in order of increasing difficulty. There is also a shorter form available, consisting of 15 designs. This short version is recommended for testing three and four-year-old children as they will usually reach a ceiling under 15 designs.

Purpose of the VMI

This test was devised as a measure of the degree to which visual perception and motor behavior are integrated in young children. The author states that the copying of geometric forms is well suited to this purpose because there is a close correlation between the visual perception and the motoric expression that is required and, because, unlike letter forms, geometric forms are equally familiar to children of varying backgrounds.

Standardization Sample

Three samples were used for standardization of the 24-form sequence: a middle-class suburban group; a rural group; a lower-middle-class urban group, all from Illinois. Only 20 children under the age of three were given the visual-motor integration test.

According to the 1964 Standardization Sample listed in the manual, these children were not counted as part of the original population. Eighteen boys and 10 girls, or a total of 28 three-year-old children were administered the VMI as part of the standardization sample. All three-year-old youngsters were representative of the suburban group; thus, there were no three-year-olds from either the rural or lower middle-class groups. It would appear, therefore, from the information presented in the manual that the standardization is adequate only for ages 5-13, and then only for children from suburban schools. It seems unlikely that the test is of much use with children below four years of age, according to Buros in the Seventh Mental Measurements Yearbook.

Testing Procedure

Children between the ages of four and five were tested in groups of three to four. Children younger than four years were tested individually. Whenever possible, testing was done in the morning while the children were rested; however, some kindergarten and preschool children were tested in the afternoon. It would appear that in view of the ease of administration, testing could easily be carried out by the classroom teacher. However, no recommendations are made about the appropriate size for a group that should take the test at a particular age level. It is a weakness of the manual that no such recommendations are made, particularly for testing very young children.

Validity

The Developmental Test of Visual-Motor Integration was constructed as an age scale. The author indicates that although the VMI is primarily an age scale, about 20 percent of the variance is not accounted for by chronological age. Some other factor (beside error), perhaps mental age, is also being measured. The author notes: "Just as correlations between height and weight are very high when a large age range is considered and low whenever yearly age groups are considered, such seems to be the case with the C.A. correlation." The important point, according to Beery, is that mental age-geometric form repeoduction (MA-GFR) correlations are a good deal higher than the chronological age-geometric form reproduction (CA-GFR) correlations, indication that mental age is even more closely related to GFR than is chronological age.

The author provides data for showing that GFR was more highly associated with MA than CA at the first grade level. No data is provided for three-year-old children. Finally, the author points out that the reproductions of boys and girls were handled separately. This fact is what led to the current investigation of sex differences of three-year-old performance on the Developmental Test of Visual-Motor Integration.

Reliability

Brad S. Chissom, Assistant Professor of Educational Research, Georgia Southern College, Statesboro, Georgia, notes in Buros' Seventh Mental Measurements Yearbook: "Reliability evidence is not reported

in any systematic way that would be useful to the test user. No report of reliability is made in the administration and scoring manual. The technical report of reliability presents a collection of coefficients, most of which were obtained from small samples and some samples of mentally retarded children and are of little use. . It would seem that reliability information should be provided for all the age levels for which the test is intended. No differential information on reliability or validity is available for the short and long forms of the test."

PART II. SEX DIFFERENCES OF THREE YEAR-OLD CHILDREN AS MEASURED BY THE BEERY VISUAL-MOTOR TEST

The purpose of the Current Study was twofold:

1) To investigate whether there is a correlation between chronological age and geometric form reproduction for three-year-old girls and three-year-old boys

2) To investigate whether three-year-old boys score lower than three-year-old girls

If the visual-motor integration test is primarily an age scale, it was felt that there should be correlation between chronological and the visual-motor integration score the child earns. It was also felt that boys would score somewhat below girls on the Beery Test in light of findings of current studies that indicate boys mature physically somewhat later than girls.

Procedure and Subjects Investigated

In the present study, the VMI was administered to 32 girls and 32 boys, a total of 64 children, ranging in age from 3-0 to 3-11, who were enrolled full-time in a experimental program in an early childhood center. The present sample was based on a cross-section of children from a major metropolitan city, which was located in the Midwest. Children were randomly selected by a computer and represented the following racial-ethnic groups: 45% White, 30% Black, 19% Spanish (includes Puerto Rican, Mexican, Cuban and other Spanish-surnamed groups), 6% American Indian and Oriental. These children also represented five socio-economic categories: (1) no education and no job (2) Eight grade graduate (3) Some high school

(4) high school graduate (5) Some college, college graduate; Mas degree and above.

Method

The VMI was administered individually to all children. Data corresponding to the following variables were recorded for each subject: sex, age in months at time of testing, VMI raw score. Data analysis consisted of two expectancy tables, one for males and one for females which were compiled to summarize the relationship among the cited variables. Validity coefficients were calculated using the Pearson Product Moment Coefficient Formula.

Results and Interpretation

The first hypothesis was not totally substantiated. Thus, while there was evidence of a correlation between chronological age and geometric form reproduction for females (.41), the correlation coefficient for males was .008.

The second hypothesis was substantiated. It was found that boys scored significantly below girls on the VMI. (See Tables 1 and 2). When failure of six months or more below CA was used as an index on the VMI between males and females, the following results were obtained:

a) 21% of the girls were 6 months or more below chronological age expectancy.

b) 53% of the boys were 6 months or more below chronological age expectancy.

Results from the current study suggest that the VMI Test might be used

to identify three-year-olds whose visual perception and motor behavior are not sufficiently integrated. Beery indicates that the reason for administering the VMI is in order to identify children who have a possible learning disability as a result of a deficit in visual-motor integration. It is questionable to conclude whether any of the "high risk" preschoolers so identified as a result of scoring significantly below CA can be labeled as "learning disabled" in view of the author's limited three-year-old standardization sample. It should also be noted that Beery does not give a "cut-off" point below which score a youngster can be accurately diagnosed as having a learning disability which would require remediation.

While this current study more than tripled the original number of three-year-old children tested by Beery, the sample is nevertheless, still too inadequate for valid predictions. Further research needs to be conducted with this age group to determine if the VMI has predictive value at such an early age.

In terms of group assessment, the VMI should be used as a rough guide rather than a fine grain instrument for the three-year-old. When a child is referred for individual psychological evaluation, the VMI is useful as a tool in providing additional data about the child in terms of planning for the child with the teacher and the parents. Thus, a VMI test score may be a useful piece of information when it is part of a complete in-depth child study evaluation and/or used for parental counseling, placement alternatives, individualized programs, and part of the total preschool experience.

EXPECTANCY TABLE 1.

SUMMARY OF VISUAL-MOTOR TEST RESULTS

OF THREE-YEAR-OLD CHILDREN

	VISUAL-MOTOR INTEGRATION SCORES (Males: N=32) In Months						TOTAL NO. PUPILS
	34-38	39-43	44-48	49-53	54-58	59-UP	
C.A. MOS 45-47	9						9
42-44	8			1	2		11
39-41	7				1		8
36-38	3			1			4

EXPECTANCY TABLE 2.

SUMMARY OF VISUAL-MOTOR TEST RESULTS

OF THREE-YEAR-OLD CHILDREN

	Visual-Motor Integration Scores (Females: N=32) In Months						Total No. Pupils
	34-38	39-43	44-48	49-53	54-58	59-UP	
C.A. MOS. 45-47	4		3			1	8
42-44	10	1	2	1	1		15
39-41	5						5
36-38	3		1				4

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